

IN THE CLAIMS

Please cancel claims 1 - 9 and 12, amend claim 11 and add new claims 13 - 35 as follows.

1. Cancel claims 1 - 9

11. (Amended) A voltage-controlled tunable filter including:

first and second cavity resonators;

means for exchanging a signal between the first and second cavity resonators;

a first voltage tunable dielectric capacitor positioned within the first cavity resonator, said dielectric capacitor including $\text{Ba}_x\text{Ca}_{1-x}\text{TiO}_3$, where x is in a range from about 0.2 to about 0.8 ~~and acting in its paraelectric state~~;

means for applying a control voltage to the first voltage tunable dielectric capacitors;

a second voltage tunable dielectric capacitor positioned within the second cavity resonator, ~~said dielectric capacitor including composite materials in their paraelectric state~~;

means for applying a control voltage to the second voltage tunable dielectric capacitors;

an input coupled to the first cavity resonator; and

an output coupled to the second cavity resonator.

12. Cancel claim 12.

13. (New) The voltage-controlled tunable filter of claim 11, wherein each of the first and second voltage tunable dielectric capacitors includes:

a first electrode;

a tunable dielectric film positioned on the first electrode; and

a second electrode positioned on a surface of the tunable dielectric film opposite the first electrode.

14. (New) The voltage-controlled tunable filter of claim 11, further comprising:

a plurality of additional coaxial resonators, electrically coupled in series to said first and second cavity resonators;

means for exchanging a signal between the additional resonators; and

a plurality of additional voltage tunable dielectric capacitors, each of the additional voltage tunable dielectric capacitors being positioned within one of the additional resonators.

15. (New) The voltage-controlled tunable filter of claim 11, further comprising:

a first rod positioned in the first resonator, wherein the first voltage tunable dielectric capacitor is positioned at one end of the first rod; and

a second rod positioned in the second resonator, wherein the second voltage tunable dielectric capacitor is positioned at one end of the second rod.

16. (New) The voltage-controlled tunable filter of claim 15, wherein:
each of the rods in the cavity resonators is serially connected with one of the voltage tunable dielectric capacitors.

17. (New) The voltage-controlled tunable filter of claim 15, wherein each of the rods in the cavity resonators is grounded.

18. (New) The voltage-controlled tunable filter of claim 11, wherein the input comprises a first coupling probe and the output comprises a second coupling probe.

19. (New) The voltage-controlled tunable filter of claim 11, wherein each of the first and second voltage tunable dielectric capacitors includes:

a substrate;

a tunable dielectric film positioned on the substrate; and

first and second electrodes positioned on a surface of the tunable dielectric film opposite the substrate, the first and second electrodes being separated to form a gap.

20. (New) A voltage-controlled tunable filter including:

first and second cavity resonators;

means for exchanging a signal between the first and second cavity resonators;

a first voltage tunable dielectric capacitor positioned within the first cavity resonator, the dielectric capacitor comprises material selected from the group consisting of: $\text{Ba}_x\text{Ca}_{1-x}\text{TiO}_3$, where x is in a range from about 0.2 to about 0.8; $\text{Pb}_x\text{Zr}_{1-x}\text{TiO}_3$, where x ranges from about 0.0 to about 1.0; $\text{Pb}_x\text{Zr}_{1-x}\text{SrTiO}_3$ where x ranges from about 0.05 to about 0.4; $\text{KTa}_x\text{Nb}_{1-x}\text{O}_3$ where x ranges from about 0.0 to about 1.0; lead lanthanum zirconium titanate (PLZT); PbTiO_3 ; BaCaZrTiO_3 ; NaNO_3 ; KNbO_3 ; LiNbO_3 ; LiTaO_3 ; PbNb_2O_6 ; PbTa_2O_6 ; $\text{KSr}(\text{NbO}_3)$ and $\text{NaBa}_2(\text{NbO}_3)_5\text{KH}_2\text{PO}_4$, and mixtures and compositions thereof;

means for applying a control voltage to the first voltage tunable dielectric capacitors;

a second voltage tunable dielectric capacitor positioned within the second cavity resonator;

means for applying a control voltage to the second voltage tunable dielectric capacitors;

an input coupled to the first cavity resonator; and

an output coupled to the second cavity resonator.

21. (New) The voltage-controlled tunable filter of claim 20, wherein each of the first and second voltage tunable dielectric capacitors includes:

a first electrode;

a tunable dielectric film positioned on the first electrode; and

a second electrode positioned on a surface of the tunable dielectric film opposite the first electrode.

22. (New) The voltage-controlled tunable filter of claim 20, further comprising:

a plurality of additional coaxial resonators, electrically coupled in series to said first and second cavity resonators;

means for exchanging a signal between the additional resonators; and

a plurality of additional voltage tunable dielectric capacitors, each of the additional voltage tunable dielectric capacitors being positioned within one of the additional resonators.

23. (New) The voltage-controlled tunable filter of claim 20, further comprising:

a first rod positioned in the first resonator, wherein the first voltage tunable dielectric capacitor is positioned at one end of the first rod; and

a second rod positioned in the second resonator, wherein the second voltage tunable dielectric capacitor is positioned at one end of the second rod.

24. (New) The voltage-controlled tunable filter of claim 23, wherein:
each of the rods in the cavity resonators is serially connected with one of the voltage tunable dielectric capacitors.

25. (New) The voltage-controlled tunable filter of claim 23, wherein each of the rods in the cavity resonators is grounded.

26. (New) The voltage-controlled tunable filter of claim 20, wherein the input comprises a first coupling probe and the output comprises a second coupling probe.

27. (New) The voltage-controlled tunable filter of claim 20, wherein each of the first and second voltage tunable dielectric capacitors includes:

a substrate;

a tunable dielectric film positioned on the substrate; and

first and second electrodes positioned on a surface of the tunable dielectric

film opposite the substrate, the first and second electrodes being separated to form a gap.

28. (New) A voltage-controlled tunable filter including:

first and second cavity resonators;

means for exchanging a signal between the first and second cavity resonators;

a first voltage tunable dielectric capacitor positioned within the first cavity resonator, said dielectric capacitor comprising $\text{Ba}_{1-x}\text{Sr}_x\text{TiO}_3$, where x is from 0.3 to 0.7 in combination with at least one non-tunable dielectric phase selected from MgO , MgTiO_3 , MgZrO_3 , MgSrZrTiO_6 , Mg_2SiO_4 , CaSiO_3 , MgAl_2O_4 , CaTiO_3 , Al_2O_3 , SiO_2 , BaSiO_3 and SrSiO_3 ;

means for applying a control voltage to the first voltage tunable dielectric capacitors;

a second voltage tunable dielectric capacitor positioned within the second cavity resonator;

means for applying a control voltage to the second voltage tunable dielectric capacitors;

an input coupled to the first cavity resonator; and

an output coupled to the second cavity resonator.

29. (New) The voltage-controlled tunable filter of claim 28, wherein each of the first and second voltage tunable dielectric capacitors includes:

a first electrode;

a tunable dielectric film positioned on the first electrode; and

a second electrode positioned on a surface of the tunable dielectric film opposite the first electrode.

30. (New) The voltage-controlled tunable filter of claim 28, further comprising:

a plurality of additional coaxial resonators, electrically coupled in series to said first and second cavity resonators;

means for exchanging a signal between the additional resonators; and
a plurality of additional voltage tunable dielectric capacitors, each of the additional voltage tunable dielectric capacitors being positioned within one of the additional resonators.

31. (New) The voltage-controlled tunable filter of claim 28, further comprising:

a first rod positioned in the first resonator, wherein the first voltage tunable dielectric capacitor is positioned at one end of the first rod; and

a second rod positioned in the second resonator, wherein the second voltage tunable dielectric capacitor is positioned at one end of the second rod.

32. (New) The voltage-controlled tunable filter of claim 31, wherein:
each of the rods in the cavity resonators is serially connected with one of the voltage tunable dielectric capacitors.

33. (New) The voltage-controlled tunable filter of claim 32, wherein each of the rods in the cavity resonators is grounded.

34. (New) The voltage-controlled tunable filter of claim 28, wherein the input comprises a first coupling probe and the output comprises a second coupling probe.

35. (New) The voltage-controlled tunable filter of claim 28, wherein each of the first and second voltage tunable dielectric capacitors includes:

a substrate;

a tunable dielectric film positioned on the substrate; and

first and second electrodes positioned on a surface of the tunable dielectric film opposite the substrate, the first and second electrodes being separated to form a gap.